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Reinhardt, on the *Cyclopterus liparis of Fabricius as a whole.* Fabricius having only fully described his first variety, it appears advisable for that reason, as well as on account of its precedence, to identify the name with that one. The name given to the present species as a variety, by Walbaum, may, in that case, be accepted as its specific appellation.

Genus CAREPROCTUS, Kroyer.

LIPARIDINÆ with the oral cleft oblique, the lower jaw advanced; teeth simple and hooked; a rudimentary suctorial disk situated far forwards, under the anterior part of the eye, and little distant from it the anus, far behind which is the anal fin.

Type.—Liparis Reinhardi *Kr.*=L. gelatinosus *R.*

This very distinct genus is especially distinguished from *Liparis* by the characters mentioned in the generic diagnosis. We owe its establishment to Dr. Kroyer, its species having been previously confounded with *Liparis.* There are probably two species, one found in Kamtschatka, and the other, long confounded with it, a native of the Greenland waters.

CAREPROCTUS REINHARDI, Kr.

Liparis gelatinosus, *Reinhardt*, Oversigt over det Kongelige Danske Videnskabernes Selskabs Forhandlingar, 1844—5, pl. x., p. lxxvii., tr. Isis von. Oken, 1844, p. 819.
Liparis gelatinosus, *Gill*, Cat. p. 47.
Liparis Reinhardi, *Kroyer*, Naturhistorisk Tidskrift, ser. 3, Bd I., p. 252.
Careproctus Reinhardi, *Kroyer*, op. cit. i., p. 257.

Synopsis of the PLEURONECTOIDS of California and North-western America.

BY THEODORE GILL.

In conformity with a promise some time since made,* I now offer a Synopsis of the Pleuronectoids of California, and add descriptions of a new species, which is at the same time the type of a distinct genus, contained in a collection made by Dr. Cooper, of the Geological Survey of California, and kindly submitted to me for examination.

One of the genera admitted—*Uropsetta*—is known to me only through the description and outline figure of its type published by Dr. Ayres. That species was originally described as *Hippoglossus californicus*, but as it evidently did not belong to *Hippoglossus*, it was withdrawn by me from that genus, and taken as the type of a peculiar one. It has since been referred to the genus *Pseudorhombus* by Günther, but the Californian naturalist, in approximating it to *Hippoglossus*, appears to have interpreted nature more truly than the English one. *Uropsetta*, indeed, is apparently more closely related to *Reinhardtius* than to any other.

Four other species are only known through descriptions that are not sufficient to positively decide their true affinities. One is the *Platessa bilineata* of Ayres;† of this the "mouth, of *moderate* dimensions, the tip of the upper maxillary scarcely reaching the plane of the pupil of the lower eye;" the "single, even row of strong, *blunt*, conical teeth;" the dextral eyes; the "scales larger and more conspicuous than in any other fish of this tribe yet found on our coast;" and the recurrent lateral line appears to indicate that it is allied to *Lepidopsetta*; but the statement that "the scales of the anterior portion of the body are nearly smooth; further back they become gradually more and more

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* Proc. Ac. N. S., Phila., 1862.
† *Ayres*, Proc. Cal. Ac. i. 40.

ciliate, though none of them are so rough as in most Flatfishes. Those of the head cover the entire opercular region and cheeks, and in part also the innerocular ridge; those of the cheeks are *strongly ciliate*," forbid us to associate it in the same genus as *L. umbrosa.* If, however, *tuberculated* scales should be substituted for *ciliated* ones, nothing else in the description would militate against such a reference. Dr. Ayres, indeed, considers this species to be "allied to *P. dentata*, Mitch.," but as his ideas of affinity are extremely crude and unreliable, nothing may be learned from them.

The second has been named by Dr. Günther *Parophrys Ayresii.* The "broad band of villiform teeth on the blind side, and with a few on the colored one," approximates it to the same group as *Hypsopsetta* and *Pleuronichthys.* The mere statement that "the dorsal fin commences somewhat before the middle of the eye," and the neglect to describe the lips furnish us negative evidence of some weight that it is not congeneric with *Pleuronichthys cœnosus* * in which the dorsal is *decurrent in front on the blind side*, and the *lips* are *plicated* as in Labroids,—characters which would not be overlooked by an observant naturalist. As in *Hypsopsetta*, the normal characters of those parts are presented, and as *Parophrys Ayresii* otherwise exhibits a concordance with that genus, it may be provisionally referred to it.

The third species—native of the seas between Kamtschatka and America—has been named by Pallas *Pleuronectes quadrituberculatus*, and has recently been referred by Dr. Günther to the genus *Parophrys.* The description of Pallas is perhaps insufficient to enable us to form a certain conclusion regarding its affinities, but the characters given—smooth body with rudimentary scales, lateral line very little decurrent anteriorly, and four tubercles on the head continuous with the lateral line—are characters found in *Pleuronectes* rather than in *Parophrys.* The cause of its reference by Günther to the latter genus is unknown, but whatever it may be, he has evidently entirely misunderstood that genus. Until we are better acquainted with the Pallasian species, it may be advisable to retain it in *Pleuronectes*, since no advantage would be gained by exchanging one doubt for another far greater.

A fourth species—*Pleuronectes cicatricosus* Pallas—is also apparently a true *Pleuronectes.*

I. Mouth small, the supramaxillary ending before under front of eye	PLEURONECTINÆ.
A. Teeth well developed, straight, blunt, and producing an incisorial edge, chiefly confined to the blind side: anterior nostril on eye side tubular; on blind with a posterior linguiform flap: posterior patulous, or nearly so.	
α. Eyes dextral.	
β. Lateral line with no recurrent or dorsal branch......	*Pleuronectes.*
ββ. Lateral line with recurrent or dorsal branch.	
γ. Cheeks with cycloid, imbricated scales...............	*Parophrys.*
γγ. Cheeks with stellated or tuberculated scales.......	*Lepidopsetta.*
αα. Eyes sinistral: scales scattered, stellated, or tuberculated, only unarmed cycloid behind........................	*Platichthys.*
AA. Teeth slender, acute, pluriserial. Anterior nostril on eye as well as blind side with flap behind; posterior patulous. Lateral line recurrent.	
α. Lips simple; dorsal continuous in front on dorsal ridge........................	*Hypsopsetta.*
αα. *Lips plicated;* dorsal in front decurved on blind side	*Pleuronichthys.*

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* Dr. Günther has referred *Pleuronichthys cœnosus*, Grd., to *Pleuronectes*, and *Pl. guttulatus* to *Parophrys.* His reasons for thus widely separating them have not been given, and are not obvious from a simple acquaintance with the literature or the species themselves. His characters of *Parophrys* are applicable to both species, but not to those of *Parophrys.*

II. Mouth large and continued more or less under the eye.
Ventrals inserted laterally.. HIPPOGLOSSINÆ
A. Caudal entire, or produced behind.
α. Lateral line straight............... .... *Psettichthys*,
αα. Lateral line arched in front...................................... *Paralichthys*.
AA. Caudal fin emarginated behind.
Dorsal and anal fins regularly arched...................... *Uropsetta*.
Dorsal and anal elevated towards middle.................. *Hippoglossus*.
III. Mouth large. Ventral of dark side inserted on the ridge
of abdomen.. RHOMBINÆ.
α. Interorbital area sharp.. *Orthopsetta*.
β. Interorbital ridge prominent, channelled................. *Metoponops*.

Subfamily *PLEURONECTINÆ* Bon.

PLEURONECTES (L.) Blkr.

PLEURONECTES FRANKLINII Gthr.

Pleuronectes (Rhombus) glacialis *Rich*, F. B. 258. (not *Pallas*.)
Pleuronectes glacialis *DeKay*, N. Y. 302.
Platessa glacialis *Rich*, Herald.
Pleuronectes Franklinii *Gthr.*
Hab.—North-western America.

PLEURONECTES QUADRITUBERCULATUS Pallas.

Pleuronectes quadrituberculata *Pallas*, Zool. Ross. As. iii. 423.
Parophrys quadrituberculata *Gthr.*, iv. 456.
Hab.—Sea between Kamtschatka and America.

PLEURONECTES CICATRICOSUS Pallas.

Pleuronectes cicatricosus *Pallas*, Ross. As. iii. 424.
Hab. "Specimina e mari inter Camtschatcam et Americam lecta mihi retulit *D. D. Merk.*"—Pall.

PAROPHRYS Grd.

PAROPHRYS VETULA Grd.

Parophrys vetulus *Grd.*
Pleuronectes digrammus *Gthr.*, iv. 445.
Parophrys vetula *Gthr.*, iv. 455.
Hab.—California.

PAROPHRYS HUBBARDII Gill.

Parophrys Hubbardii *Gill*, Pa., 1862, 281.
Hab.—San Francisco.

LEPIDOPSETTA Gill.

LEPIDOPSETTA UMBROSA Gill.

Platichthys umbrosus *Grd*, Pa., viii., 136, 1856.
Lepidopsetta umbrosa *Gill*, Pa., 1862, 326.
Pleuronectes umbrosus *Gthr.*, iv. 454.
Hab.—California.

Allied and perhaps congeneric is the following species:

Platessa bilineata *Ayres*, Cal. i. 40.
Pleuronectes bilineatus *Gthr.*, iv. 444.
Hab.—San Francisco.

PLATICHTHYS Girard.

PLATICHTHYS STELLATUS Girard.

Pleuronectes stellatus *Pallas*, Nova Acta, i. 347.
Platessa (stellata) *Cuv.*, R. A.
Pleuronectes (Platessa) stellatus *Rich.*
Platichthys rugosus *Grd.*
" (stellatus) Grd.
Hab.—Western coast generally.

HYPSOPSETTA Gill, 1862.

HYSOPSETTA GUTTULATA Gill.

Pleuronichthys guttulatus *Grd.*, Pa., viii. 137.
Pleuronectes guttulatus *Gthr.*, iv. 445.
Hypsopsetta guttulata *Gill*, Pa., 1862, 330.
Hab.—Oregon and California.

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Parophrys Ayresii *Gthr.*, iv. 456.
Hab.—California.

"The height of the body is rather *more than one-half* of the total length" (in *H. guttulata*, 1 : $2\frac{1}{6}$—1: $2\frac{1}{3}$); "the length of the head *rather* more than one-fifth," (*H. gutt.* $\frac{1}{4}$ in young—1: $4\frac{1}{2}$ in old); "the distance between the dorsal and caudal is about one-third of the depth of the fore portion of the tail" (more); "the length of the pectoral *equals* the distance of the lower eye from the end of the operculum" (less).

Is it distinct from *H. guttulata*? The color of the latter in the adult is "uniform brownish lead colored."

PLEURONICHTHYS Grd.

PLEURONICHTHYS CŒNOSUS Grd.

Pleuronichthys cœnosus *Grd.*, Pa., vi. 139.
Parophrys cœnosus *Grd.*, iv. 456.
Hab.—California.

Subfamily *HIPPOGLOSSINÆ* Gill.

PSETTICHTHYS Grd.

PSETTICHTHYS MELANOSTICTUS Grd.

Grd., Pa., vii. 140.
Hab.—California.

PARALICHTHYS* Grd.

PARALICHTHYS MACULOSUS* Grd.

Pleuronectes maculosus *Grd.*, Pa., vii. 155.
Paralichthys maculosus *Grd.*, Exp., &c., x. 147.
Hab.—California.

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* *Paralichthys* would appear to be normally sinistral from two specimens collected by the Californian Geological Survey. One of these cannot be distinguished from *P. maculosus*, the proportions, number and arrangement of the blue dots being similar; the spots are normally—six dorsal, the first under eighth dorsal ray; the second above the axil of pectoral; the sixth under sixth ray from last, and the intervening equidistant, but the fourth lower; four anal correspond to the last four dorsal ones. In the sinistral specimen, there is also one behind the eye. In the second specimen in the collections, these spots are obsolete. *Paralichthys* is distinguished from *Chænopsetta* by its larger ctenoid scales, and small supernumerary linear cycloid ones.

UROPSETTA Gill.

UROPSETTA CALIFORNICA Gill.

Hippoglossus californicus *Ayres*, Cal. ii. 29, f. 10.
Pseudorhombus californicus *Gthr.*, iv. 426.
Uropsetta californica *Gill*, Pa., 1862, 330.
Hab.—California.

HIPPOGLOSSUS Cuv., Gill.

HIPPOGLOSSUS ——— ——.

Pleuronectes hippoglossus *Pallas*, Ros. As. iii. 421.
Hippoglossus vulgaris *Ayres*, Cal., i. 40; ii. 30.
Hab.—California northwards.

Subfamily *RHOMBINÆ* (Bon.) Gill.

ORTHOPSETTA Gill.

ORTHOPSETTA SORDIDA Gill.

Psettichthys sordidus *Grd.*, Pa., vii. 142.
Citharichthys sordidus *Gthr.* iv. 421.
Orthopsetta sordida *Gill*, Pa., 1862, 330.
Hab.—California.

METOPONOPS Gill.

METOPONOPS COOPERI Gill.

Metoponops Cooperi *Gill*, infra.
Hab.—California.

Description of a new Generic type of PLEURONECTOIDS in the Collection of the Geological Survey of California.

Genus METOPONOPS Gill.

Body rather elongated rhomboid, with the dorso-nasal outline nearly rectilinear, and with the caudal peduncle moderate, somewhat constricted.

Scales moderate, cycloid, oblong, or oval, imbricated, covered also with smaller supernumerary scales. *Lateral line* perfectly straight, but slightly decurrent anteriorly, continuous in simple tubes on each scale.

Head scaly, moderate, conic, with the oblique profile rectilinear; the snout somewhat elevated and subtruncated, and the interorbital ridge prominent sideways. *Eyes* sinistral, oval, rather large, situated almost entirely in the anterior half of the head, the lower lateral; the upper directed obliquely upwards: the *interorbital area* narrow, scaly, channelled between the eyes, and bordered by two ridges which converge above behind. *Nostrils* narrow, between snout and eyes and parallel with the former; the anterior with a long flap or bridle in front; the posterior simple. *Opercula* normal.

Mouth large and very oblique; the supramaxillary ceasing under the pupil of the eye, extended obliquely downwards behind, and with a semicircular arch at its upper angle. *Lower jaw* truncated in front, with a tubercle below. *Lips* very thin and simple. *Tongue* elongated, narrow and free.

Teeth equally developed on both sides, uniserial, approximated, subequal, rather small, curved conic and acute. *Palate* unarmed.

Branchiostegal rays seven. *Branchial membrane* deeply emarginated below.

Dorsal fin with its origin considerably behind the right posterior nostril, above or rather behind the anterior margin of the orbit, regularly arched, with its rays simple. *Anal* with its origin under or behind the inferior axil of the pectoral, and similar to the dorsal.

Caudal fin convex behind.

Pectoral fins pointed.

Ventral fins subjugular, inserted obliquely, with its rays approximated, and its innermost attached to the breast by a membrane.

The lower pharyngeal bones are entirely separated, compressed and laminar, with the body emarginated below and the posterior processes directed upwards, attenuated towards their ends; with the teeth pauciserial; of the inner row slender, elongated and acute, curved outwards in front and erect behind; of the outer much smaller, but similar in form. *Upper pharyngeals* three on each side laminar, each with a row of large, slender, curved teeth.

The branchial arches have compressed, pointed rakers, progressively decreasing in length from the first to the fourth arch, on which last they are short and triangular; each armed with small, slender teeth on their internal margins.

Metoponops is readily distinguishable by the characters above given, especially the prominence of the interorbital ridge and the consequent oblique position on the forehead of the upper eye, whose line of vision is upwards; the scaly channel of the ridge itself; straight lateral line; dentition, and the form of the lower pharyngeal bones, especially the paraboloid emargination below in front. It is apparently as closely related to its cohabitant of California, *Orthopsetta*, as any other, but that genus is at once distinguished by its compressed head and little prominent, narrow interorbital ridge.

METOPONOPS COOPERI Gill.

The height of the body is contained about three times in the total length; the head about four times, and the caudal six times and a half. The longitudinal diameter of either orbit equals about a third of the head's length. The snout is rhomboid, decurved in front, and its length from the lower orbit to the symphisis equals about a fifth of the head's length. The supramaxillary ends under the front of the pupil, and from the symphisis to its end enters twice in the distance between the chin and preopercular margin. The greatest height of the dorsal equals the length of the upper jaw, as well as does that of the anal. The pectoral fin equals about a sixth of the total length.

D. 89. A. 71. P. 13.

The color is uniform brownish.

A single adult specimen of this species is in the collection formed by the Californian Geological Survey, of which Prof. Whitney is the superintendent, and was obtained by Dr. Cooper, the naturalist of the Survey, at Santa Barbara, in May, 1863. This specimen is in poor condition, having been apparently obtained only after exposure for some time to the sun; the fins have been dried, and the pectorals and ventrals are more or less broken, especially the latter, while the abdomen is much injured. I am consequently compelled to omit some desirable details. The species itself is a very interesting one, and I give myself the pleasure of dedicating it to my friend, Dr. Cooper.

On the Affinities of several doubtful BRITISH FISHES.

BY THEODORE GILL.

Among the few still uncertain species of British fishes, none are involved in greater obscurity than those presented under the name of *Ophidium imberbe* by Pennant and Montague, and those referred by Hoy to the Linnæan *Trichiurus lepturus*. A detailed investigation into the literature and history of the former has enabled me to demonstrate its relations, and the discovery of a recent type in the Caribbean Sea permits me to at least suggest the affinities of the latter,* concerning which I had long been perplexed. These con-

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* See Proceed. Acad. Nat. Sci. Phila., 1863, p. 228.